REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested. Claims 14-22 are in this application. Claim 14 has been amended. Claims 19-22 have been added to alternately and additionally claim the present invention. Claims 1-13 have been cancelled.

Applicant requests the Examiner to initial and return a copy of the Form 1449 that was filed with an Information Disclosure Statement on March 14, 2005.

The present divisional application was filed with six sheets of informal drawings and six sheets of formal drawings. In the present office action, the Examiner approved the drawings filed with the application. To remove any confusion as to which drawings (formal or informal) have been approved by the Examiner, applicant requests that the drawings filed with the application be replaced with the six sheets of replacement drawings attached in Appendix A. The replacement drawings are identical to the formal drawings filed with the application. By approving the present set of replacement drawings, the present set of replacement drawings will be the drawings printed with the patent.

The Examiner rejected claims 14 and 17-18 under 35 U.S.C. §102(b) as being anticipated by Krishnan (U.S. Patent No. 5,998,299). For the reasons set forth below, applicant respectfully traverses this rejection.

Claim 14 recites, in part,

> "forming a layer of insulation material over a semiconductor substrate;
> "forming a layer of conductive material on the layer of insulation material;
> "etching the layer of conductive material to form a trace, the trace having a top surface and a bottom surface;
> "etching the trace to form a number of slot openings in the top surface of the trace, the slot openings each having a bottom surface spaced apart from the bottom surface of the trace; and
> "forming a layer of isolation material over the trace to fill up the slot openings."

In rejecting the claims, the Examiner pointed to FIG. 10, FIGS. 11A-11C, and FIGS. 15A-15D of Krishnan. The Examiner appears to point to the step of forming metal layer 110 shown in FIG. 11A of Krishnan as constituting the "forming a layer of conductive material" element of claim 14, and the etching steps shown in FIGS. 11B-11C as constituting the etching elements of claim 14.

Alternately, the Examiner pointed to the step of forming metal layer 210 shown in FIG. 15A of Krishnan as constituting the "forming a layer of conductive material" element of claim 14, and the etching steps shown in FIGS. 15B-15D as constituting the etching elements of claim 14. The Krishnan reference, however, fails to teach or suggest the "forming a layer of isolation material" element because the Krishnan reference fails to teach or suggest the formation of slots.

In the example shown in FIGS. 11A-11C, the Krishnan reference illustrates an etch that utilizes a mask with a number of different sized openings. As is well known in the art, wider mask openings allow the underlying material to be etched through faster than narrower mask openings. (See also column 5, lines 17-18 of Krishnan.)

The relationship between mask width and etch rate is illustrated in FIG. 11B of Krishnan which shows the largest opening being etched through first, and FIG. 11C of Krishnan which shows the middle-sized opening being etched through before the smallest-sized opening is etched through. (FIG. 10 of Krishnan only shows one example of a plan view of the relationship between transient fuse 102 and metal line 152.)

However, regardless of the size of the mask opening, at the end of the etch, the metal exposed by each mask opening, including the smallest-sized opening, is completely removed. (See column 5, lines 20-22 of Krishnan.) Thus, since the etch continues until the metal exposed by each mask opening (largest, middle, and smallest) is completely removed, it is not possible for slots to be present in metal layer 110 after the etch.

Thus, Krishnan fails to teach or suggest the formation of slots. If no slots are present in metal layer 110 following the completion of the etch, then it is not possible for the Krishnan reference to teach or suggest that a layer of isolation material is formed over the trace to fill up the slot openings as required by claim 14. As a result, claim 14 is not anticipated by the example shown in FIGS. 10 and 11A-11C of Krishnan. In addition, since claims 17-22 depend either directly or indirectly from claim 14, claims 17-22 are not anticipated by Krishnan for the same reasons as claim 14.

In the example shown in FIGS. 15A-15D, the Krishnan reference again illustrates an etch. In the FIGS. 11A-11C example, the smallest mask openings are utilized to form a transient fuse 114. Because the smallest mask openings etch the slowest, transient fuse 114 maintains a connection to substrate 100 until the metal lines have been formed.

On the other hand, the FIGS. 15A-15D example utilizes a contact/via 202 as a transient fuse. As before, the purpose of the transient fuse (contact/via 202) is to maintain a connection to the substrate (substrate 200) until the metal lines have been formed. FIG. 15D differs from FIG. 15C in that metal layer 210 of FIG. 15C represents the metal-1 layer such that contact/via 202 of FIG. 15C can directly contact substrate 200, whereas metal layer 210 of FIG. 15D represents the metal-2 or higher layer such that contact/via 202 of FIG. 15D indirectly contacts substrate 200 via an electrode 220, such as another contact/via.

However, at the end of the etch, as shown in FIGS. 15C and 13 of Krishnan, the metal exposed by each mask opening is completely removed, along with a portion of contact/via 202. (See also column 5, lines 58-61 of Krishnan.) Thus, since the etch continues until the metal exposed by each mask opening is completely removed, it is not possible for slots to be present in metal layer 210 after the etch.

Thus, Krishnan fails to teach or suggest the formation of slots. If no slots are present in metal layer 210 following the completion of the etch, then it is not possible for the Krishnan reference to teach or suggest that a layer of isolation

material is formed over the trace to fill up the slot openings as required by claim 14. As a result, claim 14 is not anticipated by the example shown in FIGS. 15A-15D of Krishnan. In addition, since claims 17-22 depend either directly or indirectly from claim 14, claims 17-22 are not anticipated by Krishnan for the same reasons as claim 14.

The Examiner also rejected claims 15-16 under 35 U.S.C. §103(a) as being unpatentable over Krishnan. As noted above, the Krishnan reference fails to teach or suggest the formation of slots, and the formation of a layer of isolation material. As a result, claim 14 is patentable over Krishnan. Claims 15-16 depend either directly or indirectly from claim 14, and are patentable over Krishnan for the same reasons as claim 14.

Thus, for the foregoing reasons, it is submitted that all of the claims are in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are respectively requested.

Respectfully submitted,

Dated: 6-6-05 By: Mark C. Pickering

Mark C. Pickering
Registration No. 36,239
Attorney for Assignee

P.O. Box 300
Petaluma, CA 94953-0300
Telephone: (707) 762-5500
Facsimile: (707) 762-5504
Customer No. 33402